

**1.20.15****Obj:** To calculate exponential growth.**(0-10) Do Now:**

2. Simplify:

- a.  $4(5)^2$                       b.  $(4 + 5)^2$                       c.  $4 + 5^2$                       d.  $(4)^2(5)$                       e.  $4^2 + 5$                       f.  $4^2(5^2)$

**(10-30) PARCC****(30-45) Notes: Exponential Growth****Ask:** What types of things in the real world grow exponentially?**Definition:** function that demonstrates a consistent growth rate or percentage over time**Formula:**  $y = a * b^x$ 

$a$  = initial amount,  $b$  = growth factor (greater than 0 and not equal to 1),  $x$  = number of time periods,  $y$  = amount after “ $x$ ” time periods (output)

\*If you are given the growth factor as a percent, change the percent to a decimal and add 1.  
(Why 1? Because 1 represents 100%, and you still have 100% of what you started with.)

**Difference between Linear and Exponential Functions**

Function	$x = 2$	$x = 3$	$x = 4$	$x = 5$
<b>Linear:</b> $y = 4x + 2$	$y = \underline{\hspace{2cm}}$	$y = \underline{\hspace{2cm}}$	$y = \underline{\hspace{2cm}}$	$y = \underline{\hspace{2cm}}$
<b>Exponential:</b> $y = 4 * 2^x$	$y = \underline{\hspace{2cm}}$	$y = \underline{\hspace{2cm}}$	$y = \underline{\hspace{2cm}}$	$y = \underline{\hspace{2cm}}$

**Ex 1:** The population of mouse-rats is increasing by a factor of 5 every three months. If the current population of mouse-rats is 16, how many mouse-rats will there be in a year?

**Ex 2:** Google’s stock is increasing 3.5% daily. If the stock is currently at 1,176 points, what will the stock be at in 8 days?

**Exit Slip as HW**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Obj: \_\_\_\_\_

Do Now:

1. Take out HW, pencil, planner and binder. Copy HW in planner; leave ALL out to be checked.

2. Simplify. Box your final answers.

a.  $4(5)^2$

b.  $(4 + 5)^2$

c.  $4 + 5^2$

d.  $(4)^2(5)$

e.  $4^2 + 5$

f.  $4^2(5^2)$

Notes: \_\_\_\_\_

**Definition:** \_\_\_\_\_ that demonstrates a \_\_\_\_\_  
\_\_\_\_\_ rate or \_\_\_\_\_ over \_\_\_\_\_

**Formula:**

\*If you are given the \_\_\_\_\_ factor as a \_\_\_\_\_, change the \_\_\_\_\_ to a \_\_\_\_\_ and add \_\_\_\_\_.

**Difference between Linear and Exponential Functions**

Function	x = 2	x = 3	x = 4	x = 5
<b>Linear:</b> $y = 4x + 2$	y = _____	y = _____	y = _____	y = _____
<b>Exponential:</b> $y = 4 * 2^x$	y = _____	y = _____	y = _____	y = _____

**Ex 1:**

**Ex 2:**

Name: \_\_\_\_\_ **EXIT SLIP/HW** Date: \_\_\_\_\_

**Please rate yourself honestly by checking only the TRUE statements.**

- \_\_\_\_ I had a pencil already sharpened or with lead.
- \_\_\_\_ I had my math binder and planner.
- \_\_\_\_ I began work on the Do Now immediately and silently.
- \_\_\_\_ I respected my peers by actively listening to them and peer tutoring when possible.
- \_\_\_\_ I followed all class rules, *esp*: kept my shirt tucked in/outerwear off, no gum/food, and did not talk to others.
- \_\_\_\_ I respected the class by being attentive and by refraining from distracting others.
- \_\_\_\_ I actively participated in class by raising my hand at least three times to ask or answer questions.
- \_\_\_\_ I worked to the best of my ability and fully participated in math for the entire period.

**1. What is exponential growth? Write a complete sentence and use algebraic terms.**

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**2. What is the difference between linear growth and exponential growth? Write a complete sentence and use algebraic terms.**

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**3. Write the exponential growth formula.**

**4. In the exponential growth formula, what does  $a$  represent?**

**5. In the exponential growth formula, what does  $b$  represent?**

**6. In the exponential growth formula, what does  $x$  represent?**

**7. In the exponential growth formula, what does  $y$  represent?**

**8. The population of rabbits in Central Park was 34 in 1994. The population increases by 12% annually. How many rabbits were in Central Park in 2010? Round to the nearest rabbit.**

a. Write the general exponential growth formula. \_\_\_\_\_

b. Substitute the values from the word problem into the exponential growth formula.

\_\_\_\_\_

c. Evaluate and box your final answer.

d. Fill in the table of values for the function.

Year	1996	1998	2000	2002	2004	2006	2008	2010
x								
y								

e. Graph the function using your table of values. Label your axes.



